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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DANG, KHANH	

ART UNIT	PAPER NUMBER
2111	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/728,700	HICKERSON ET AL.	
	Examiner	Art Unit	
	Khanh Dang	2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-8,18 and 27-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-8, 18, and 27-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Newly introduced claims 28 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "wherein the (FC-GS-3) Protocol is vendor- unique" is inaccurate. FC-GS-3 is a standardized protocol. With regard to the term "vendor-unique", Applicants, in the originally filed specification, [0019], disclose that "an MPT request may be contained within a standard UDP (Ethernet) packet as a vendor-unique payload. UDP packets can be shipped directly from server to server via an Ethernet link (out-of-band communication), or through the Fibre Channel interface between host adapters (in-band or out-of-band communication), transparently."

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

New claims 28 and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. If Applicants disagree with the Examiner, Applicants are required to point out to the originally filed specification by

citing page and line number for support of the subject matter of claim 8. See also the rejection of claim 28 under 112, 2nd paragraph above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 18, and new claims 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the Fibre Channel Standards, and LSI Logic's Fusion-MPT.

With regard to claim 1, Heil discloses a method encapsulating a bus interface selecting request within a common transport message that facilitates usage with bus interface constructs, comprising: receiving a common transport message by a local host bus adapter (Heil discloses a local host bus adapter (HBA 117, Fig. 1, for example); a

remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig, 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example), wherein an I/O request from the host 100 transmitted via a PCI interface 115/116.5/200/230 and received by a local host bus adapter 117); modifying the common transport message in the local host bus adapter to contain a bus message passing request (the I/O request is then encapsulated in packet and transmitted via Fiber Channel Backbone 121); transmitting the modified common transport message from the local host bus adapter to a remote host bus adapter, the modified common transport message including an address, a command and data in SCSI format, wherein the modified common transport message is transmitted from the local host bus adapter to the remote host bus adapter via an external Ethernet link, the external Ethernet link directly, communicatively connecting a local software driver of the local host bus adapter to a remote software driver of the remote host bus adapter ((the encapsulated FC packet is transmitted to the remote host bus adapter 126. in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof. Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local

bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory, which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. In another word, the encapsulated FC packet is used for updating and configuring the remote host adapter.

As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example)); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig, 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, previously cited). Note that Fibre Channel is a gigabit-speed network technology primarily used for storage networking. Fibre Channel is standardized in the T11 Technical Committee of the InterNational Committee for Information Technology Standards (INCITS), an American National Standard Institute–

accredited standards committee. It started for use primarily in the supercomputer field, but has become the standard connection type for storage area networks in enterprise storage. Despite its name, Fibre Channel signaling can run on both twisted-pair copper wire and fiber optic cables. Fibre Channel Protocol (FCP) is the interface protocol of SCSI on the Fibre Channel. Thus, it is clear that the encapsulated or modified common transport message in Heil trnsmitted over the Fiber Channel include an address, a command, and data in SCSI format.

Heil does not disclose specifically that the modified or encapsulated transport message transported over a Fibre Channel is in compliant with the Fibre Channel Protocol including the Fibre Channel General Service Common Transport Protocol, version 3.

However, version 3 is old and well-known as evidenced by the Fibre Channel Standards from Wikipedia as an improved version over previous versions of Fibre Channel Protocol.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use version 3 in Heil, as taught by the Fibre Channel Standards, for the purpose of providing improvements over other older versions of the Fibre Channel Protocol. Note that it is clear that the FC-GS-3 Protocol employs in-band and out-of-band communication; and thus management of the remote HBA can be performed via in-band and out-of-band communication afforded by FC-GS-3 protocol.

The further difference between Heil and the claimed subject matter is the use of Fusion-MPT for the bus message passing request.

However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT for the bus message passing request in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

With regard to claim 4, it is clear that HBA management must include identification of bus type, since protocol and driver update is directly related to bus type of the HBA.

With regard to claim 6, it is clear that in Heil, the bus type is Fibre Channel (FC).

With regard to claim 18, see discussion above, since the subject matter presented in claim 18 has already been addressed.

With regard to claim 27, see discussion above, since the subject matter presented in claim 18 has already been addressed.

With regard to claim 28, see discussion regarding FC-GS-3 protocol above. See also the 112 rejection and "new matter" rejection.

With regard to claim 29, as discussed above regarding the FC protocol and various other protocols and HBA, it is clear that the system of Heil allows communication from operating system level to driver level to external HBA level.

With regard to claims 30-32, as discussed above, in-band and out-of-band communications are afforded by FC-GS3. Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, previously cited).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view the Fibre Channel Standards, and LSI Logic's Fusion-MPT as applied to claim 1 above, and futher in view of the Emulex SLI Architecture.

The further difference between the claimed subject matter and that of Heil is the use of SAS bus for the HBA. However, the use of SAS is old and well-known as evidenced by Emulex SLI Architecture, previously cited. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ SAS in Heil,

since the use of SAS bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting SAS bus in Heil only involves ordinary skill in the art.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view the Fibre Channel Standards, and LSI Logic's Fusion-MPT as applied to claim 1 above, and further in view of the Infiniband Storage.

The further difference between the claimed subject matter and that of Heil is the use of Infiniband bus for the HBA. However, the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage, previously below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Infiniband in Heil, since the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage; and selecting Infiniband bus in Heil only involves ordinary skill in the art.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the Fibre Channel Standards, and LSI Logic's Fusion-MPT as applied to claim 1 above, and further in view of the Emulex SLI Architecture.

The further difference between the claimed subject matter and that of Heil is the use of iSCSI bus for the HBA. However, the use of iSCSI is old and well-known as evidenced by Emulex SLI Architecture, previously cited. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ iSCSI in

Heil, since the use of iSCSI bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting iSCSI bus in Heil only involves ordinary skill in the art.

Response to Arguments

Applicants' arguments filed 11/01/2006 have been fully considered but they are not persuasive.

At the outset, Applicants are reminded that claims subject to examination will be given their broadest reasonable interpretation consistent with the specification. *In re Morris, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997)*. As a matter of fact, the "examiner has the duty of police claim language by giving it the broadest reasonable interpretation." *Springs Window Fashions LP v. Novo Industries, L.P.*, 65 USPQ2d 1862, 1830, (Fed. Cir. 2003). Applicants are also reminded that claimed subject matter not the specification, is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding the prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d, 155 USPQ 687 (1986).

With this in mind, the discussion will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitations that are not in the claims or any arguments that are irrelevant and/or do not relate to any specific claim language will not be warranted.

The 102 Rejection:

Applicants' amendment overcomes the 102 Rejection.

The 103 Rejection:

With regard to claim 1, Applicants argue that:

Independent Claims 1, 18 and 27 of the present invention each generally recite:

> "utilizing the modified common transport message for updating and configuring the remote host bus adapter."

In the present invention, the modified common transport message is utilized for allowing updating and configuring of a remote HBA by a local HBA. (Present Application, Page 5, Paragraph 0010 and Page 6, Paragraph 0013). None of the above cited references, either alone or in combination, teach, disclose or suggest the above-referenced elements. For example, Heil focuses on intercommunication between clustered I/O nodes (Heil, Abstract), while the present invention focuses on administration and configuration of remote HBAs. (Present Application, Page 5, Paragraph 0010).

Independent Claims 1, 18 and 27 of the present invention each generally further recite:

> "wherein the system/method is configured for/allows for in-band and out-of-band remote host bus adapter management."

The system of the present invention allows for both in-band and out-of-band remote host bus adapter management. (Present Application, Page 4, Paragraph 0010; Page 5, Paragraph 0011; Page 6, Paragraph 0014; Page 7, Paragraph 0017). Cited references, such as Emulex HBAnywhere or Emulex SLI Architecture, do not allow for out-of-band remote host bus adapter management. Further, neither Heil, nor any of the above cited references, either alone or in combination, teach, disclose or suggest the above-referenced elements.

Contrary to Applicants' argument, the encapsulated FC packet is transmitted to the remote host bus adapter 126. In Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof). Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory, which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. In another word, the encapsulated FC packet is used for updating and configuring the remote host adapter.

With regard to Applicants' argument directing to the "in-band" and "out-of-band" communications, it is clear that the FC-GS-3 Protocol employs in-band and out-of-band

communication; and thus management of the remote HBA can be performed via in-band and out-of-band communication afforded by FC-GS-3 protocol.

Applicants further argue that:

> Further, there would have been no motivation for one of ordinary skill in the art at the time of the present invention to look to Heil or implement Heil with either Emulex HBAnyware or LSI's Fusion-MPT technology to arrive at the present invention. The present invention focuses on configuration and updating of remote HBAs, (Present Application, Page 5, Paragraph 0010) while Heil proposes a method of intercommunication between clustered I/O nodes. (Heil, Abstract). Therefore, it would not have been obvious for one of ordinary skill in the art at the time of the present invention to look to, modify or combine Heil with the other cited references to arrive at the claimed invention.
>
> Based on the above rationale, there would have been no motivation for one of ordinary skill at the time of the present invention to combine the above-cited references.

Contrary to Applicants' argument, the motivation for the combination of Heil and Fibre Channel Standards, and LSI Logic's Fusion-MPT is clearly set forth in the 35 USC 103 rejection. As clearly stated in the rejection, "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use version 3 in Heil, as taught by the Fibre Channel Standards, for the purpose of providing improvements over other older versions of the Fibre Channel Protocol." And also, "It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT for the bus message passing request in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA

architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design." As already pointed out in Applicants' remark, oviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In the instant case, as stated above, it is clear that the motivation for the combination of Heil, Fibre Channel Standards, and LSI Logic's Fusion-MPT is clearly set forth in the 35 USC 103 rejection. Further, as set forth in MPEP Section 2144, "the strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. *In re Semaker*, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983)." In the instant case, the advantage or expected beneficial result, which would have been produced by the combination, is a new and improved protocol, higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Dang whose telephone number is 571-272-3626. The examiner can normally be reached on Monday-Friday from 9:AM to 5:PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart, can be reached on 571-272-3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khanh Dang
Primary Examiner